

FACTS VERSUS FICTION!

A N E S S A Y

ON

THE FUNCTIONS

OF

T H E B R A I N .

by William Lawrence

“ Error alone needs artificial support : truth can stand by itself.”

PROFESSOR LAWRENCE.

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PRELIMINARY REMARKS.

IN considering a subject rendered peculiarly important by the prevalence of false notions respecting it, we must entirely discard fear, remove from our minds the dogmas with which they have been impressed, and examine with calmness the bearing of the facts brought forward for its illustration. While prejudice impedes the mental search, truth is with difficulty explored. Follow the dictates of reason and you must be led to just and rational conclusions; follow those of the passions—quit once the paths of observation, and you may be lured unconsciously into the regions of imagination.

The miseries of human life, the physical and moral calamities pervading the earth, seem to have early suggested the idea of a future state of existence—a state, in which more justice and more happiness might prevail. Legislators soon perceived that this wild and imaginary notion could be made a powerful instrument of government, for, as it would divert attention from the tangible pleasures yielded by the earth, and reconcile our miserable species to privations hardly to be endured, so would it assist their schemes of plunder and oppression: hence, the philosopher, who displays and upholds truth, has always been regarded by the tyrant with a jaundiced eye.

To detail the many fantastical notions that have been conceived and promulgated regarding the soul, would occupy much time, and in the end effect no purpose but that of bewildering the intellect in a labyrinth of error.—The unintelligible jargon written on the subject of its immortality, by *those who gained their livelihood by the propagation of such doctrines* is too unmeaning to merit a serious refutation. Let us then proceed to an investigation of the facts connected with the phenomenon, and see whether they will lead to the conclusion that the mind of man is a separate and distinct principle residing in his corporeal fabric, or simply, the function of an organ—the result of the action of the brain.

Somnambulism, dream, and sleep constitute a serious diffi-

culty to immaterialists. 'The illiterate of this class have been satisfied with the *explanation* given them by their teachers—that it was a *mystery*.—"A revealed truth which we do not comprehend." To materialists there is no mystery in the matter—save that connected with the existence of all things, for 'none hath raised the veil of Isis.'

Contemplating the mind as the result of the action of an organ, complicated in its nature, composed of many separate and distinct parts united and acting on each other, somnambulism and dream are but the partial inactivity of the faculties—the activity of some while others are quiescent. Let us reflect on what passes in our own minds when we are engaged in the consideration of ideal subjects; when our unbridled imagination wanders through the regions of fancy, and forms to our intellectual eye, objects and scenes that have no real existence. Let us then suppose, as is actually the case in dreaming, the optic, the auditory—the sensual nerves, and the faculties immediately connected with them in a state of quiescence; we then have not the power of comparing our *real* with our *imaginary* state; fancy alone controuls and directs the movements of the body.

Sleep, still more confounds the immaterialist—for where is the *immortal* soul during that period? is *it too* wearied? and does *it too* require rest? no—for the very *negative* notions entertained of it preclude the possibility of that. Has it then taken flight to some *immaterial* place—to a sojournment more congenial with its nature? these are but a few of the many difficulties which present themselves to those who contemplate the mind's separate existence. Consider it, but as it appears, merely the function of an organ, and the matter is explained. As the muscles are fatigued and require rest, so should the nerves; the medullary mass composing the brain, so complicated in its organization, being wearied by constant action, requires cessation; it gradually furnishes indications of its exhausted condition, until completely overcome, and no longer able to act, the body sinks into torpor.

Priestley's observations on the subject are worthy of attention, he says, "If the soul be immaterial and the body material, neither the generation nor the destruction of the body can have any effect with respect to it. This foreign principle must have been united to it either at the time of conception or at birth; and must either have been created at the time of such union, or have existed in a separate state prior to that union. Must a *divine power* be necessarily employed to pro-

duce a soul whenever the human species copulate? or must some of the pre-existent spirits be obliged, immediately upon that event, to descend from the superior regions to inhabit the new-found embryo? these are suppositions hardly to be considered at all, without being immediately rejected as extremely improbable if not absurd." And again, "It is considered, that spirit and body can have no common properties; and when it is asked, how then can they act one upon another; and how can they be so intimately connected as to be continually and necessarily subject to each other's influence? it is acknowledged to be a difficulty and a mystery which we cannot comprehend. But had this question been considered with due attention, what has been called a difficulty would have been deemed an impossibility. It is impossible to conceive even the possibility of mutual action without some common property, by means of which the things that act and re-act upon each other may have some connection. A substance that is hard may act upon, and be acted upon, by another hard substance, or even one that is soft; but it is certainly impossible that it should affect, or be affected by a substance that can make *no resistance at all*.—But admitting, that substances which have no common property can nevertheless affect and be affected by each other, to be no more than a difficulty, it is, however a difficulty of such magnitude, as far to exceed that of conceiving that the principle of sensation may possibly consist with matter; and therefore if of two difficulties it be the most philosophical to take the least, we must of course abandon the hypothesis of two *heterogeneous* and incompatible principles in man, which is clogged with the greater difficulty of conception, and admit that of the *uniformity of his nature*, which is only attended with a less difficulty."

"If the operations ascribed to mind may result from the powers of matter, why should we suppose a being which is useless, and which solves no difficulty? it is easy to see, that the properties of matter do not exclude those of intelligence; but it cannot be imagined how a being, which has no property besides intelligence, can make use of matter. In reality, how can this substance, which bears no relation to matter, be sensible of it, or perceive it; in order to see things, it is necessary that they make an impression upon us, that there be some relation between us and them; but what can be this relation? it is affirmed, that we have as clear an idea of spirit as we have of matter, each being equally the unknown support of known properties; matter of extension and solidity, and spirit

of sensation and thought. But still since the substance is confessedly *unknown* to us, it must also be *unknown* to us what properties it is capable of supporting; and therefore unless there be a real inconsistency in the properties themselves, those which have hitherto been ascribed to both substances may belong to either of them. For this reason Locke, who maintains the immateriality of the soul, and yet maintains that, *for any thing we know to the contrary, matter may have the property of thought added to it*, ought to have concluded that this is really the case; since according to the rules of philosophizing, we ought not to multiply causes without necessity."

Haller, after enumerating the various manifestations of mind from infancy to dotage, concludes, "That naturally the power of thinking seems as much to belong to the body as any power of man whatever. Naturally there appears no more reason to suppose that a man can think out of the body than he can hear sounds or feel cold out of the body." He might have added, that to seek for *sound* independent of *atmospheric concussion* would not be more absurd, than looking for *mind* independent of *the action of the brain*.

Thus we find mere philosophy, affords no proof of the immortality of the soul—none of its separate existence. Let us then survey the labours of the physiologist, and see if, in the depths of scientific research, *he* has been able to discover traces of this immortal and *immaterial* being.

In presenting the following Essay, taken from Lawrence's splendid work on 'Comparative Anatomy,' to the public, it would be unjust to pass altogether unnoticed the individual himself. However he may be borne down by a powerful faction; whatever his after conduct may be, we cannot but admire the man who spurning the base trammels of self-interest, dared assert the noble prerogative he possessed—that of boldly displaying truth; who, in pursuing the paths of science, levelled in his march the rotten fabrics of superstition, and scorned to contaminate the professor's gown by prostituting his genius to ignorance and fanaticism. The name of Lawrence shall be transmitted to posterity with respect and veneration, while those of his enemies are but glanced at and forgotten.

AN ESSAY,

*Selected from Lectures on Physiology, Zoology, and the
Natural History of Man.*

BY WILLIAM LAWRENCE, F. R. S.

“ EXAMINE the mind, the grand prerogative of man. Where is the mind of the foetus? where that of the child just born? do we not see it actually built up before our eyes by the actions of the five external senses, and of the gradually developed internal faculties? do we not trace it advancing by a slow progress through infancy and childhood, to the perfect expansion of its faculties in the adult;—annihilated for a time by a blow on the head, or the shedding of a little blood in apoplexy,—decaying as the body declines in old age;—and finally reduced to an amount hardly perceptible, when the body, worn out by the mere exercise of the organs, reaches by the simple operation of natural decay, that state of decrepitude most aptly termed second childhood?

Where then shall we find proofs of the mind’s independence on the bodily structure? of that mind, which, like the corporeal frame, is infantile in the child, manly in the adult, sick and debilitated in disease, frenzied or melancholy in the madman, enfeebled in the decline of life, doting in decrepitude, and annihilated by death?

Take away from the mind of man, or from that of any other animal, the operations of the five external senses, and the functions of the brain, and what will be left behind?

That life then, or the assemblage of the functions, is immediately dependent on organization, appears to me, physiologically speaking, as clear as that the presence of the sun above the horizon causes the light of day; and to suppose that we could have light without that luminary, would not be more unreasonable than to conceive that life is independent of the animal body, in which the vital phenomena are observed.

I say, *physiologically* speaking; and beg you to attend particularly to this qualification; because the theological doctrine of the soul, and its separate existence, has nothing to do with

this physiological question, but rests on a *species of proof* altogether different. These *sublime* dogmas could never have been brought to light by the labours of the anatomist and physiologist. An *immaterial* and *spiritual* being could not have been discovered amid the blood and filth of the dissecting room; and the very idea of resorting to this low and dirty source for a proof of so *exalted* and *refined* a *truth*, is an illustration of what we daily see, the powerful bias that professional habits and the exclusive contemplation of a particular subject, give even to the strongest minds,—an illustration of that *esprit de metier*, which led the honest currier in the threatened city to recommend a fortification of leather.

There is no digestion without an alimentary cavity; no biliary secretion without some kind of liver; no thought without a brain.

To talk of life as independent of an animal body; to speak of a function without reference to an appropriate organ is physiologically absurd. It is an opposition to the evidence of our senses and rational faculties. It is looking for an effect without a cause. We might as reasonably expect daylight while the sun is below the horizon. What should we think of abstracting elasticity, cohesion, gravity, and bestowing on them a separate existence from the bodies in which those properties are seen?

The striking differences between living and inorganic bodies, and the strong contrast of their respective properties, naturally excited curiosity respecting the causes of this diversity, and endeavours to show the mode in which it was effected. Here we quit the path of observation, and wander into the regions of imagination and conjecture. It is the poetic ground of physiology; but the union is unnatural, and, like other unnatural unions unproductive. The fiction spoils the science, and the admixture of science is fatal to inspiration. The fictitious beings of poetry are generally interesting in themselves, and are brought forward to answer some useful purpose; but the genii and spirits of physiology are awkward and clumsy, and do nothing at last which could not be accomplished just as well without them: they literally encumber us with their help.

For those who think it impossible that the living organic structures should have vital properties without some extrinsic aid;—although they require no such assistance for the equally wonderful affinities of chemistry, for gravity, elasticity, or the other properties of matter, a great variety of explanations, suited to all tastes and comprehensions, has been provided.

Some are contented with stating that the properties of life arise from a vital principle. This explanation has the merit of simplicity, whatever we may think of its profoundness ; and it has the advantage of being transferable and equally applicable to any other subject. Some hold that an immaterial principle, and others, that a material, but invisible and very subtle agent is superadded to the obvious structure of the body, and enables it to exhibit vital phenomena. The former explanation will be of use to those who are conversant with immaterial beings, and who understand how they are connected with and act on matter. But I know no description of persons likely to benefit by the latter, for subtle matter is still matter ; and if this fine stuff can possess vital properties, surely they may reside in a fabric which differs only in being a little coarser.

Plato made the vital principle to be an emanation of the *anima mundi* or soul of the world ; an explanation, no doubt quite satisfactory to those, who know what the soul of the world is, and how other souls emanate from it.

The Bramins of the East hold a similar notion ; but they make the soul after death pass on into other bodies or into animals, according to its behaviour ; admitting, however, that those of the good are immediately re-absorbed into the Divinity. Some of the Greeks adopted a distinct vital, sensitive, and rational principle in man.

These are merely specimens ; a few articles as patterns selected from a vast assortment. If you do not like either of them, there are plenty more to choose from. As these and a hundred other hypotheses are all supported by equally good proof ; which is neither more nor less in each instance, than the thorough conviction of the inventor ; and as they are inconsistent with each other, and, therefore, mutually destructive, we need not trouble ourselves further until their respective advocates can agree together in selecting some one for their patronage, and discarding the rest. For of these as of the numerous religions of the world, only one *can* be true,

Shall I be told that thought is inconsistent with matter ; that we cannot conceive how medullary substance can perceive, remember, judge, reason ? I acknowledge that we are entirely ignorant how the parts of the brain accomplish those purposes—as we are how the muscles contract, or how any other living purpose is effected :—as we are how heavy bodies are attracted to the earth, how iron is drawn to the magnet, or how two salts decompose each other. Experience is in all these cases our

sole, if not sufficient instructress; and the constant conjunction of phenomena, as exhibited in her lessons, is the sole ground for affirming a necessary connection between them. If we go beyond this and come to inquire the manner how, the mechanism by which these things are effected, we shall find every thing around us equally mysterious, equally incomprehensible;—from the stone, which falls to the earth, to the comet traversing the heavens:—from the thread attracted by amber or sealing-wax, to the revolutions of planets in their orbits:—from the formation of a maggot in putrid flesh, or a mite in cheese, to the production of a Newton or a Franklin.

Let us survey the natural history of the human mind;—its rise, progress, various fates, and decay;—and then judge whether these accord best with the hypothesis of an immaterial agent, or with the plain dictates of common sense, and the analogy of every other organ and function throughout the boundless extent of living beings.

You must bring to this physiological question a sincere and earnest love of truth: dismissing from your minds all the prejudices and alarms which have been so industriously connected with it. If you enter on the inquiry in the spirit of the bigot and partizan, suffering a cloud of fears and hopes, desires and aversions, to hang round your understandings, you will never discern objects clearly; their colours, shapes, dimensions, will be confused, distorted, and obscured by the intellectual mist. Our business is to inquire what is true; not what will supply the best topics of pretty composition, and eloquent declamation, addressed to the prejudices, the passions, and the ignorance of our hearers. We need not fear the result of investigation: truth is like a native rustic beauty, most lovely when unadorned and seen in the open light of day; your fine hypotheses and specious theories are like the unfortunate females who supply the want or the loss of native charms, and repair the breaches of age or disease by paint, finery, and decorations which can only be exhibited in the glaring lights, the artificial atmosphere, and the unnatural scenery of the theatre or saloon. Whenever it is thoroughly discussed, truth will not fail to come, like tried gold from the fire. Like Ajax it requires nothing but daylight and fair play.

Reason and free inquiry are the only effectual antidotes of error. Give them full scope, and they will uphold the truth by bringing false opinions and all the spurious offspring of ignorance, prejudice, and self-interest, before their severe tribunal, and subjecting them to the test of close investigation.

Error alone needs artificial support: truth can stand by itself.

Sir Everard Home, with the assistance of Mr. Bauer and his microscope, has shewn us a man eight days old from the time of conception; about as broad and a little longer than a pin's head. He satisfied himself that the brain of this homunculus was discernable. Could the immaterial mind have been connected with it at this time; or was the tenement too small even for so ethereal a lodger? at the full period of utero-gestation it is still difficult to trace any vestiges of mind, and the believers in its separate existence have left us quite in the dark on the precise time at which the spiritual guest arrives in his corporeal dwelling, the interesting and important moment, of amalgamation or combination of the earthly dust and the ethereal essence. The Roman Catholic Church has cut the knot, which no one else could unite, and has decided that the little mortal on its passage into this world of trouble, has a soul to be saved; it accordingly directs and authorizes midwives, in cases of difficult labour, where the death of the infant is apprehended, to baptize it by means of a syringe introduced into the vagina, and thus to save it from perdition.

They whose scruples are not quite set at rest by the decision of the church, nor by being told that the mind has not yet taken up its quarters in the brain, endeavour to account for the entire absence of mental phenomena at the time of birth by the senses and the brain not having been yet called into action by the impression of external objects.

These organs begin to be exercised as soon as the child is born; and a faint glimmering of mind is dimly perceived in the course of the first months of existence; but it is as weak and infantile as the body.

As the senses acquire their powers and the cerebral jelly becomes firmer, the mind gradually strengthens; slowly advances with the body, through childhood to puberty, and becomes adult when the development of the frame is complete: it is moreover male or female according to the sex of the body. In the perfect period of organization, the mind is seen in the plenitude of its powers; but this state of full vigour is short in duration both for the intellect and the corporeal fabric. The wear and tear of the latter is evidenced in its mental movements; with the decline of organization the mind decays: it becomes decrepid with the body; and both are at the same time extinguished by death.

What do we infer from this succession of phenomena?—the existence and action of a principle entirely distinct from the

body? or a close analogy to the history of all other organs and functions.

The number and kind of the intellectual phenomena in different animals correspond closely to the degree of development of the brain. The mind of the negro and hottentot, of the Calmuc and the Carib, is inferior to that of the European; and their organization is also less perfect. The large cranium and high forehead of the ourang-outang lift him above his brother monkeys; but the developement of his cerebral hemispheres, and his mental manifestations are both equally below those of the negro. The gradation of organization and of mind passes through the monkey, dog, elephant, horse, to other quadrupeds; thence to birds, reptiles, and fishes; and so on to the lowest links of the animal chain.

In ascending these steps of one ladder, following in regular succession at equal intervals, where shall we find the boundary of unassisted organization? where place the beginning of the immaterial adjunct? in that view, which assimilates the functions of the brain to those of other organic parts, this case has no difficulty. As the structure of the brain is more exquisite, perfect, and complex, its functions ought to be proportionally so. It is no slight proof of the doctrine now enforced, that the fact is actually thus: that the mental power of brutes, as far as we can see, are proportional to their organization.

We cannot deny to animals all participation in rational endowments, without shutting our eyes to the most obvious facts;—to indications of reasoning, which the unprejudiced observation of mankind has not failed to recognize and appreciate. Without adverting to the well known instances of comparison, judgment, and sagacity, in the elephant, the dog, and many other animals, let us read the character drawn by Humboldt of the South American mules.

“When the mules feel themselves in danger, they stop, turning their heads to the right and to the left: the motion of their ears seems to indicate that they reflect on the decision they ought to take. Their resolution is slow, but always just if it be free; that is to say if it be not crossed nor hastened by the imprudence of the traveller. It is on the frightful roads of the Andes, during journeys of six or seven months across mountains furrowed by torrents, that the intelligence of horses and beasts of burden displays itself in an astonishing manner. Thus the mountaineers are heard to say ‘I will not give you the mule whose step is the easiest, but him who reasons best.’”

If the intellectual phenomena of man require an immaterial

principle superadded to the brain, we must equally concede it to those more rational animals, which exhibit manifestations differing from some of the human only in degree. If we grant it to these we cannot refuse it to the next in order, and so on in succession to the whole series : to the oyster, the sea anemone, the polype, the microscopic animalcules. Is any one prepared to admit the existence of immaterial principles in all these cases? if not, he must equally reject it in man.

It is admitted that an idiot with a malformed brain has no mind ; that the sagacious dog and half reasonable elephant do not require any thing superadded to their brains ; it is allowed that a dog or elephant excels inferior animals in consequence of possessing a more perfect cerebral structure ; it is strongly suspected that a Newton or a Shakspeare excels other mortals only by a more ample development of the anterior cerebral lobes, by having an extra inch of brain in the right place ; yet the immaterialist will not concede the obvious corollary of all these admissions ; viz. that the mind of man is merely that more perfect exhibition of mental phenomena, which the more complete development of the brain would lead us to expect, and still perplex us with the gratuitous difficulty of their immaterial hypothesis. Thought it is positively and dogmatically asserted, cannot be an act of matter. Yet no feelings, no thought, no intellectual operation has ever been seen except in conjunction with the brain ; and living matter is acknowledged by most persons to be capable of what makes the nearest possible approach to thinking. The strongest advocate for immaterialism seeks no further than the body for his explanation of all the vital processes, of muscular contraction, nutrition, secretion, &c.—operations quite as different from any affection of inorganic substance, as reasoning or thought. He will even allow the brain to be capable of sensation.

Who knows the capabilities of matter so perfectly, as to be able to say that it can see, hear, smell, taste, and feel, but cannot possibly reflect, imagine, judge? who has appreciated them so exactly, as to be able to decide that it can execute the mental functions of an elephant, a dog, or an ourang-outang, but cannot perform those of a Negro or a Hottentot?

To say that a thing of merely negative properties, that is an immaterial substance, which is neither evidenced by any direct testimony, nor by any indirect proof from its effects, does exist, and can think, is quite consistent in those who deny thought to animal structures, where we see it going on every day.

If the mental processes be not the function of the brain, what is its office? in animals, which possess only a small part of the human cerebral structure, sensation exists, and in many cases is more acute than in man. What employment shall we find for all that man possesses over and above this portion;—for the large and prodigiously developed human hemispheres? are we to believe that these serve only to round the figure of the organ, or to fill the cranium?

It is necessary for you to form clear opinions on this subject, as it has immediate reference to an important branch of pathology. They who consider the mental operations as acts of an immaterial being, and thus dis-connect the sound state of the mind from organization, act very consistently in disjoining insanity also from the corporeal structure, and in representing it as a disease, not of the brain, but of the mind. Thus we come to disease of an immaterial being, for which, suitably enough, moral treatment has been recommended.

I firmly believe, on the contrary, that the various forms of insanity, that all the affections comprehended under the general term of mental derangement, are only evidences of cerebral affections;—disordered manifestations of those organs, whose healthy action produces the phenomena called mental;—in short symptoms of a diseased brain.

These symptoms have the same relation to the brain, as vomiting, indigestion, heartburn to the stomach, cough, asthma, to the lungs; or any other deranged functions to their corresponding organs.

If the biliary secretions be increased, diminished, suspended or altered, we have no hesitation in referring to changes in the condition of the liver, as the immediate cause of these phenomena. We explain the state of respiration, whether slow, hurried, impeded by cough, spasm, &c. by the various conditions of the lungs, and other parts concerned in breathing. These explanations are deemed perfectly satisfactory.

What should we think of a person, who told us that the organs have nothing to do with the business; that cholera, jaundice, hepatitis, are diseases of an immaterial hepatic being; that asthma, cough, consumption, are affections of a subtle pulmonary matter, or that in both cases the disorder is not in bodily organs, but in a vital principle? If such a statement would be deemed too absurd for any serious comment in the derangement of the liver, lungs, and other organic parts, how can it be received in the brain?

The very persons who use this language of diseases of the

mind, speak and reason correctly respecting the other affections of the brain. When it is compressed by a piece of bone, or by effused blood or serum, and when all intellectual phenomena are more or less completely suspended, they do not say that the mind is squeezed, that the immaterial principle suffers pressure. For the ravings of delirium and frenzy, the excitation and subsequent stupor of intoxication, they find an adequate explanation in the state of the cerebral circulation, without fancying that the mind is delirious, mad, or drunk.

In these cases the seat of the disease, the cause of the symptoms, is too obvious to escape notice. In many forms of insanity the affection of the cerebral organization is less strongly marked, slower in its progress, but generally very recognizable, and abundantly sufficient to explain the diseased manifestations,—to afford a material organic cause for the phenomena—for the augmented or diminished energy, or the altered nature of the various feelings and the intellectual faculties.

I have examined after death the heads of many insane persons, and have hardly seen a single brain, which did not exhibit obvious marks of disease. In recent cases, loaded vessels, increased serous secretions: in all instances of longer duration, unequivocal signs of present or past increased action;—Blood-vessels apparently more numerous, membranes thickened and opaque, depositions of coagulated lymph forming adhesions or adventitious membranes, watery effusions, even abscesses. Add to this, that the insane often become paralytic, or are suddenly cut off by apoplexy.

Sometimes indeed the mental phenomena are disturbed, without any visible deviation from the healthy structure of the brain; as digestion or biliary secretion may be impaired or altered without any recognizable change of structure in the stomach or liver. The brain, like other parts of this complicated machine, may be diseased sympathetically; and we see it recover.

Thus we find the brain, like other parts, subject to what is called functional disorder; but although we cannot actually demonstrate the fact, we no more doubt that the material cause of the symptoms or external signs of disease is in this organ, than we do that impaired biliary secretion has its source in the liver, or faulty digestion of the stomach. The brain does not often come under the inspection of the anatomist in such cases of functional disorder; and I am convinced from my own experience, that very few heads of persons dying deranged

will be examined after death, without showing diseased structure or evident signs of increased vascular activity.

The effect of medical treatment completely corroborates these views. Indeed they, who talk of and believe in diseases of the mind, are too wise to put their trust in mental remedies. Arguments, syllogisms, discourses, sermons, have never yet restored any patient; the moral pharmacoæpia is quite inefficient, and no real benefit can be conferred without vigorous medical treatment, which is efficacious in these affections, as in the diseases of any other organs.

In thus drawing your attention to the physiology of the brain, I have been influenced not merely by the intrinsic interest and importance of the subject, but by a wish to exemplify the aid, which human and comparative anatomy and physiology are capable of affording each other, and to show how the data furnished by both tend to illustrate pathology. I have purposely avoided noticing those considerations of the tendency of certain physiological doctrines, which have sometimes been industriously mixed up with these disquisitions. In defence of a weak cause, and in failure of direct arguments, appeals to the passions and prejudices have been indulged, attempts have been made to fix public odium on the supporters of this or that opinion, and direct charges of bad motives and injurious consequences have been reinforced by all the acts of misrepresentation, insinuation, and inuendo.

To discover truth, and to represent it in the clearest and most intelligible manner, seem to me the only proper objects of physiological, or indeed of any other inquiries. Free discussion is the surest way, not only to disclose or strengthen what is true, but to detect and expose what is fallacious. Let us not then pay so bad a compliment to truth, as to use in its defence foul blows and unlawful weapons. Its adversaries, if it has any, will be dispatched soon enough without the aid of the stiletto and the bowl.

The arguments against the expediency of divulging an opinion, although it may be true, from the possibility of its being perverted, has been so much hacknied, so often employed in the last resort by the defenders of established abuses and errors, that every one, who is conversant with controversy, rejects it immediately as the sure mark of a bad cause, as the last refuge of retreating error."